

# PUBLICATIONS

Educational Series . No. 2

THE STORY OF

## BOOKS for the BLIND

by
LOUIS W. RODENBERG

American Foundation for the Blind 15 West 16th Street, New York 11, N. Y.





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American Foundation for the Blind New York HV1666 R copy 4



Published 1952 by the AMERICAN FOUNDATION FOR THE BLIND 15 West 16th Street, New York 11, N. Y. PRINTED IN U.S.A.

### The Story of Books for the Blind

#### IN FAR DISTANT TIMES

A new dawn of philanthropy, which was perhaps the first true dawn, broke upon this troublous earth shortly after the middle of the eighteenth century. During this period, France, with her glorious depth of social instincts, gave to men among other things the first school for deaf-mutes and the first school for the blind. As to the blind, the time preceding this dawn, and extending backward through the Renaissance indefinitely into the Middle Ages, may be called the Era of Speculation. All manner of primitive things were thought of and even tried by way of educating isolated blind individuals here or there—letters were carved on wooden blocks, or pressed on wax tablets, or hung on thread; but nothing of a general or permanent nature came of these attempts.

Indeed, it required centuries for the human mind to convince itself that the lowly blind could and should read at all, that they were deserving of education. As late as 1750 the philosopher Diderot was thrown into prison for his unorthodox guesses about the ability of the blind and the effect of blindness on intelligence.

## BEGINNING OF EDUCATION OF THE BLIND— THE ROMAN LETTER ERA

And what may not the inspiration of woman accomplish? In 1780 Maria Theresa von Paradis, the cultured blind baroness of Austria, a composer and skilled organist, performed in Paris and was entertained royally. Her attainments captured the admiration of one Valentin Haüy. At the time he was engaged by French business concerns in translating their foreign mail. Already he had been touched by the misery of blind beggars who haunted public places. His inspiration to bring them better mental and social status fired into resolve and action. In 1784 he induced a young beggar, François Leseuer, to be his pupil, and the next year, with the aid of the French Philanthropic Society, opened the first school for the blind. Quite by accident Leseuer one day made out the imprint of a few letters left

on one of his teacher's papers by the printing press. Forthwith Haüy experimented with type to emboss books, trying out various forms of letters used by the seeing. He chose a modified form of Roman letter and printed the first books in relief.

Then came the Deluge. After the smoke of the French Revolution and the first Napoleonic campaigns cleared away, the dawn of the humanitarian movement continued to spread over the world. The school of Haüy had been taken over by the state. Following his example, promoters here and there on the Continent and in Britain opened asylums and schools for the blind. This period, which was characterized by the beginnings of things for social uplift, continued for eighty or more years. Schools for the blind dotted the globe, last of all coming to Japan and China.

As to raised print, this same span of years may be called the period of the Roman letter. Numerous and persistent were the efforts that were made to modify this type in order to make it more legible to touch. Naturally the solution of the reading problem of the blind was sought by most men in the experience of the seeing. "The fact is," comments Pierre Villey in his great book, *The World of the Blind*, "they were talking to the fingers the language of the eyes." Discouragement was in the air from the start, and very soon it was found that points (first Roman letters outlined in pin points) were more tangible than the blurry line letters, yet books in line letter were published to the end of the nineteenth century by some presses, but in ever decreasing number.

#### MOON TYPE

Arbitrary codes composed entirely of dots began to appear as early as 1819 but these did not take root deeply for half a century. Between the time the dot codes emerged and the time line letters were submerged, all manner of far-fetched plans came to the surface. Some of these proposed entirely new systems made up of lines, angles, curves and even dots in various positions and combinations, while others proposed extreme modification of Roman letters. The most successful of the latter efforts was made in 1847 by Dr. William Moon of Brighton, England. He used some of the Roman capitals in bare outline, as, for example, capital A without the cross-stroke. Other letters were purely arbitrary but simple, as an oblique line tilted leftward for R and rightward for S. At the end of the line the finger was led downward by a curve to the next line, so that reading was

from right to left on alternate lines. Because of the legibility of this system it gained much vogue in England and America. In 1884 Moon was the official type in thirty-six British institutions. And to this day it remains the system used by some of the adult blind who are unable to master braille.

#### THE ASCENDENCY OF BRAILLE

After the middle of the nineteenth century a new period began in the history of touch reading. It is not so well defined as to its beginning, extending in general over the last third of the nineteenth century and the first third of the twentieth. Nor may we at first glance distinguish who deserves to be singled out as the leading actor on the new stage. But before tracing the ascendency of braille, let us return to its obscure nativity back in the years when line letter experimentation was still occupying most teachers of the blind.

#### LOUIS BRAILLE

In a little old stone hut at the foot of the stony hill of the village of Coupvray, twenty-six miles east of Paris beyond the Marne, Louis Braille was born on January 4, 1809. His father was a harness-maker. At the age of three the child blinded himself while playing with one of his father's awls. At the age of ten he was sent to the Paris institution for the young blind. At seventeen he was made a junior master and at nineteen an instructor.

In 1819, the year the boy came to Paris, Charles Barbier, an engineer and cavalry officer interested in signal codes, brought forward the first system of points in arbitrary arrangement. He grouped his points in successive "cells" along the line, each cell containing twelve possible points arranged six high and two wide. He invented a writing board with grooves over which the paper could be laid and impressed with a stylus. Over the paper was fixed a thin metal plate with window-like openings to guide the stylus to the positions of dots in the cells. Barbier's system was exhibited at the institution where its possibilities tantalized more than one imagination. It was phonetic, like shorthand, instead of alphabetic; the characters were too tall for the finger tips; the constructions were complicated; yet here was the real genesis of great things to be. Barbier was the father of point reading.

Louis Braille, before he was twenty, through some inspiration of which there is no record, designed an alphabet of the upper half of the Barbier cell. The braille cell, then, became three points high and two wide. His constructions of signs were systematic in the extreme, though brilliant and simple. Out of the upper four points he made ten basic characters, and from these in turn he made thirty more by adding points from the third level, first the lower left point, then both lower points, and finally the lower right point. Without going farther into this system, suffice it to say that the arrangement of all sixty-three characters possible in the two-by-three cell was cleverly methodical. In the main he seems to have disregarded the fact that some of these characters are more legible than others and that certain letters of the alphabet occur much more frequently than others. Louis Braille used no shorthand signs, as did Barbier, and would probably have objected to the contractions or abbreviations of words nowadays. By 1834 he had worked out his system in great detail, including a musical notation which, in all of its essentials, remains to the present time capable of presenting to the blind all varieties of musical composition.

He held organ posts in churches of Paris, being a musician of considerable ability. It is said that he was permitted to teach his point system to only a few pupils after hours. All his life he was without robust health. His death occurred in 1852, two years before his system was officially established in the institution where for a quarter of a century his genius had worked so modestly and so effectively.

By 1860 rumors of the novel system had gone abroad and it was not uncommon for blind persons from distant lands to write to the Paris institution for the strange writing tablets. Some of these reached America and in 1859 the new school at St. Louis was the first in America to adopt braille.

#### DR. ARMITAGE

The era of the ascendency of braille really began when Dr. Armitage of England went forth as the "Great Missionary of Braille". Armitage had only partial sight and had a first-hand knowledge of the problems of finger reading. He became the center of a group of able blind individuals whom he organized into the British and Foreign Blind Association. Observe that their torch was more than a local light: work for the blind, as all philanthropy, was asserting its international conscience. Always, with few exceptions, newcomers into work for the blind have grappled, one after another, first with the problem of reading. So it was with Valentin Haüy, the first educator of the blind; with Klein in Austria and Zeune in Prussia; with

Drs. Howe and Friedlander pioneering in America; with Frank Hall and Edward Allen who held Thermopylae for braille against its greatest foe, New York Point; these and other educators played with embossed type as soon as they saw their pupils seated at desks without adequate textbooks. A great teacher not only will instruct from books but will see to it that books are made. So, too, it was with the greater organizations—with the American Association of Instructors of the Blind in 1871, with the international congresses of teachers of the blind which began in 1873, with the American Association of Workers for the Blind in 1905, with the American Foundation for the Blind in 1923, and with national associations in France, Germany, Italy and elsewhere. And foremost among these stands Dr. Armitage and the British and Foreign Blind Association, 1868. They determined that the vexing problem of types must be settled once and for all so that the building of a standard library might proceed. Even New York Point, the newest of codes at that time, was given long and unbiased scrutiny. Their decision was unanimous in favor of braille. This was little short of audacity, for when the investigation had started, the braille cult in Britain numbered only a dozen individuals, while other systems were in use in a dozen or more institutions.

#### NEW YORK POINT

But what was this New York Point system which could debate the ground with braille before the Armitage Council? In America, too, there was a great missionary for punctiform type, as determined as Armitage to find a new answer to an old question. Director William Wait of the New York Institute for the Education of the Blind conducted numerous well-planned experiments from 1859 to 1866 to determine legibility of prevailing systems. He proved line letter inferior to point systems—yes, to braille. Perhaps no one in the world had ever handled the matter with better science and, no doubt, he felt like that about it. The braille system was a foreign infant but little known beyond its cradle. True, the young school in St. Louis was using it, be it admitted, with an amazing record of reading ability among its few pupils. But Wait had respect for the principle of frequency of letter occurrence, which respect the braille system did not show. Only sixty-three characters were possible in braille. Wait had in mind a dot arrangement which admitted of many more, an arrangement two points high and variable from one to four points in width. Some say he got this idea from his predecessor, Dr. John D. Russ, first director of the institution. Be that as it may, Wait claimed the invention and for a certainty worked out the details of it. He assigned his simpler characters to those letters of the alphabet which are overworked, and his whole system, including a full musical notation, was scientific and clever to the last detail. The American Printing House for the Blind at Louisville, Kentucky, had just started its work. Wait influenced its trustees to add his to the three or four other systems already being printed there. By 1890 the Wait banner flew everywhere in America but its triumph was de jure rather than de facto. In some schools music braille was preferred. New York Point had remarkable merits as well as a militant promoter. Had braille failed elsewhere in the world, William Wait would today occupy the place of Louis Braille in our esteem.

#### BRAILLE CROSSES FRONTIERS

In 1873 began international co-operation in the first congress of teachers of the blind in Vienna and Dr. Armitage there carried his campaign for braille abroad which he had begun at home. International committees began to work. The braille principle was noised about, played with, and fought over in an ever widening field. So ardently was it advocated that ten years after the first congress Dr. Armitage claimed that braille was being used in every institution in the world excepting a few in North America: it may have been used, but it was far from established. All the way from Philadelphia to Warsaw local reformers advanced rival systems, but one by one they failed.

Even Cupid enlisted in the cause of braille. It is told how, in a midwestern school, in the early 70's before any point code was recognized by the authorities, a few pupils had procured braille frames. The lovelorns of the institution, under strict segregation, wrote each other strangely legible notes of consolation—legible to themselves but not to the authorities. Forthwith the evil instruments were confiscated but were shortly returned because with them the students could make remarkable progress in music as well as in love. The music master could now dictate the piece to the pupil who, with this new-fangled tablet, could write, read and keep the music instead of getting it by ear and forgetting it.

Braille had crossed frontiers and had entered the hearts of the blind. However, in the 80's its triumph was far from certain, for over half of the British institutions were using Moon type and most of the American schools New York Point, while line letter books were still being produced.

#### More Confusion and Strife

Far-seeing and courageous advocates were indeed needed. By this time rival codes of great merit were entrenching in the field. Very early there were dissenters in the braille ranks. In 1876, at the second Blindenlehrer-Congress in Dresden, a German clique attempted an international coup to revise the braille alphabet on the basis of letter recurrence, but in a few years this uprising was stayed. In 1878 similar heresy flamed up in America and had official support.

Joel W. Smith, tuning master in the Boston school, encouraged by Director Anagnos, and also applying the principle of letter recurrence, worked out the so-called American braille which he announced at the Columbus convention of the American Association of Instructors of the Blind in 1878. He retained only twelve letters of the orthodox alphabet and redistributed all other signs, but did not alter the music notation. Smith made one notable contribution to the good of all braille: he insisted on capitalization and provided a very legible capital prefix. The awakening of a conscience for exact transcription was timely. Wait's capitals were a bit clumsy and were being dropped, as also was the braille capital prefix in Europe. In 1890 American braille was endorsed by a committee of rebel instructors of the blind whose aim it was to pull down as many Wait banners as possible. In 1910 they forced the American Printing House for the Blind to print a portion of its books in the new system, so that this plant for several years produced books in two distinct types—New York point and American braille—both of them out of line with orthodox braille. Thus was confusion worse confounded, while arguments, jealousies and wasteful duplications ran riot.

#### A GREAT INVENTION

Yet it was one of the offenders against uniformity, one who came uninitiated to the work and failed to resolve the existing chaos, who, neverertheless, in a few short years, achieved great things which, some claimed, rank him second only to Louis Braille.

Frank H. Hall was made superintendent of the Illinois School for the Blind in 1890. Coming fresh from the greater world of education, in which he had gained wide recognition, he at once deplored the scarcity of embossed textbooks, the clumsy method of writing with a stylus on inverted paper, and the primitive equipment for embossing. By May, 1892 he had aligned himself with the new American braille movement as against New York Point and had originated a braille typewriter capable of five or six strokes per second. The machine was equipped with six keys, one for each of the points of the braille cell. Any one of the sixty-three characters could be made at one stroke by depressing the required keys.

In Europe it was beginning to be the practice to print braille books not from movable type but from thin metal sheets upon which dots were embossed by means of a mallet, a stylus and a frame. Mr. Hall enlarged his writer to stereotype metal sheets with foot power. His machines were shown at the Chicago Columbian Exposition in 1893 and arrangements for their manufacture were concluded. They made their way to institutions here and there throughout America and Europe. Textbooks in greater abundance were now possible. Libraries of books and music scores began to grow. Hall had aligned himself with braille because of its mechanical simplicity. This feature was forever one of the elements of strength in the system, accounting also for its legibility. Frank Hall had stemmed the tide of New York Point and, by supporting the braille principle, opened the way to its universal victory.

#### TRIUMPH OF BRAILLE IN THE UNITED STATES

After 1900 books in line letter began to disappear and American schools were almost equally divided between New York Point and American Braille. The duplication of books and magazines in the latter two systems was a colossal waste; and, worst of all, blind people had only half of the possible library.

The first organized complaint came from a group of blind people who held a charter meeting in St. Louis in 1895. In 1905 this organization became the American Association of Workers for the Blind and continued the work of the earlier group by appointing its first Uniform Type Committee. In 1912 the committee tested twelve hundred American and British readers and made a most exhaustive report. British braille stood highest but with some of its weak spots uncovered. Acting in part on scientific findings and in part on the hope of compromising the doomed factionalist, the committee created a system of its own called Standard Dot which combined the orthodox braille alphabet with a number of New York Point features.

Battles and investigations continued. Conversion to the international idea was painful and stopped half way in 1917 with the adoption of a portion of the British list of contractions. In 1905 the British had worked out three grades of braille: grade one, fully spelled; grade two, moderately contracted; grade three, highly contracted. This they called Revised braille. The American committee chose only part of grade two; hence the designation, grade one and a half, which was also called Revised braille, in America. All of the word abbreviations and the two-cell contractions of grade two were refused and the capital and italic signs were reversed.

Americans generally were of the opinion that the British certainly could and certainly should read the new grade by way of establishing uniformity. With pioneering courage American presses scrapped old plates and began all over again to build a new library. But the British blind did not read the American books. No, they weren't still fighting for George III, as some thought: in reality they were held back by a basic fact in the braille system itself. And what could this be?

Many of the more legible signs are not in the alphabet but are used as contractions. Grade two is more condensed than grade one and a half and has fewer dots. Why should he, the British reader, track his fingers over eleven per cent more line-length, many unnecessary dots and unaccustomed word forms? Why should he increase every hour of writing by seven minutes of extra work? Grade one and a half, with forty-four contractions—about as many as the gone-but-not-forgotten older systems had—had accustomed American readers to use only about one-fourth as many contractions as the British readers were using in grade two. At first American courage paled at the thought. Nevertheless large numbers of books were ordered from England to supplement the young library in the United States. In 1922 the first key to grade two was published unofficially in the States. More and more blind people were training themselves to read Revised braille, now keenly conscious of the injustice of bygone confusions. With increased experience many American readers began to share the objection to tracking their fingers over unnecessary lines and confused word forms. As was ever the case, the braille system was being ushered to its universal triumph by the intimate experience of the blind themselves. Why, it was beginning to be asked, should the waste of duplication of books in grade one and a half go on when these books were certain to be replaced in time by preferred editions in grade two?

#### STANDARD ENGLISH BRAILLE

The American Foundation for the Blind was created in 1921 and in 1923 the American Association of Workers for the Blind designated it to carry on such work as was left unfinished by the retiring Commission on Uniform Type, the latter having carried on since 1915. Out of the preceding decade of struggle had come veterans trained to heroic vision, purpose, and sacrifice. They had paid dearly for America's half century of waste and want of leadership in the serious business of making books for the blind. The American Foundation for the Blind was the culminating inspiration of two of the veterans, and their inspiration received general support. One of these was H. Randolph Latimer, then principal of the Maryland School for the Blind, a blind man of the New York Point camp who had guided the Commission on Uniform Type to its final achievements, and in whose vision was born the idea of the American Foundation for the Blind. The other was M. C. Migel, a seeing manufacturer and humanitarian, who early enlisted the full strength of his insight and means to support the type committees and finally to establish the Foundation

In due time Robert B. Irwin became Executive Director of the American Foundation for the Blind, a blind man, who was to pilot the way to final standardization. He influenced the adoption in America of a standard size of page and of two-side printing. The American Foundation for the Blind, with the co-operation of the American Printing House for the Blind, in 1925 published a key to music notation which included universal usages; and, in co-operation with the American Braille Press in Paris and other European authorities, promoted the Paris conference on braille music in 1929 which resulted in international standardization of the musical code. In this year, too, Irwin and others sensed that the tide of preference in America was definitely turning toward grade two.

To determine the value of certain braille signs, the American Foundation for the Blind compiled exhaustive tables of words and gathered other data which were to play a convincing part in the negotiations that followed. Both British and American authorities were impressed that the time was ripe to accomplish final standardization of usage in the English-speaking world. This aim was realized in July, 1932, when a conference of duly authorized representatives of both countries met in London and concurred on a revised form of British braille that was called Standard English braille. Thereby

America adopted most of grade two, the British sacrificing some of the less useful contractions and accepting the reversal of the capital and italic signs. Certain compromises on rules of writing were also agreed on. A handbook setting forth Standard English braille was edited by the conference and is now used in all English-speaking lands.

In rapid succession printing houses and organizations accepted the handbook, so that at the time of this writing there is virtual uniformity, although for the moment, here or there, die-hard traditions persist, as, for example, the noncontraction of over-lapping syllables. Suffice it that the intimate experience of blind readers will have its say in the end, as it always has had in the long approach to uniformity. Standard English braille is now the system of reading and writing used by about 5800 school children in America and about 30,000 adults, and these figures are approximately duplicated in the British Empire.

Thus, a century after its birth, with rival codes defeated and with itself groomed to uniformity of usage, the braille system stands as one of the greatest benefactions to mankind.

#### ON THE READING OF BRAILLE

Obviously blind people read with their fingers. There have been cases of touch reading with the toes or with the tongue by unfortunites who had no hands. Several books have been written of late on the technique of finger reading, presenting data and conclusions derived from elaborate experimentation. In Germany, for instance, a test seemed to prove that the best reading by the blind was done with the left hand, though this has not been borne out by experiments made elsewhere. It is safe to say that the right index finger gets the brunt of the work and is supported by the left index finger which either reads part of the line or keeps the place at the left margin. Often the middle fingers are used alone or in conjunction with the index fingers, while in rare cases a kind of span-vision is achieved by three or four fingers together. Usually the book is held parallel with the desk but in some cases oblique positions are preferred.

The average speed of braille reading approximates one hundred words a minute, though some have claimed to double this record. The rate of public speaking is from one hundred and fifty to one hundred and sixty words a minute, while practiced silent reading with the eyes may cover five hundred words. To keep up the speed

of braille reading is a challenge to educators of the blind. If reading is not easy for the individual, the braille system cannot give him that degree of independence of seeing help of which it is capable. The more fluent the reading, the more even is the movement of the hands, but even in most of the rapid cases there is a tendency to move up and down in a slight undulation. In extremely poor reading this tendency amounts to an impatient rubbing motion. Thus, touch reading has been described as being either synthetic (fluent) or analytic (interrupted).

In braille as in print, word forms are factors in reading. The more the individual reads, the more automatic will his perception become. Therefore the symbols which constitute the word should appear always in the same construction. As before stated, the contraction of braille speeds up reading. Naturally, then, to make fluency of braille reading possible words should always be contracted in the same word forms. This is at the core of the demand for uniformity. When embossers violate this principle, they lay many little stumbling-stones in the path of the finger.

Standard spacing of points was recommended in 1917 by the Commission on Uniform Type. The distance between centers of adjoining points was fixed at .090. This makes the average braille character, including the spread of its dots, a little more than an eighth of an inch wide and a little less than a quarter of an inch high. The spacing of letters along the line is now exactly one quarter inch. The distance from line to line is .4 of an inch while the height of dot varies, being difficult of exact measurement. A cell of a larger projection is quite commonly used for the adult beginner.

For those initiated in touch reading there are many interesting problems—perhaps there are undiscovered possibilities. There are the problems of the primary classes of children where, for example, it is asked if it be advisable to teach contractions from the start; the problems of the middle grades where it is asked if full syllabication is essential to good spelling; the problems of singing classes where it is asked if words and notes may be written together for sight-singing; or the problems of teaching the newly-blind adult which are indeed difficult. In these places are the front trenches where are fought some of the real battles against blindness.

#### ON THE WRITING OF BRAILLE

The oldest and still most used method of writing braille is by

means of the grooved or pitted metal tablet first used by Charles Barbier. In this writing with the stylus the face of the sheet is down and writing is from right to left with a reversal of the letters. When the sheet is turned over, the characters are in normal position for reading from left to right. Stylus writing is simple enough, for the back-side thinking of the characters soon becomes automatic. The average speed of such writing is from ten to fifteen words a minute, which is about half the average for pencil writing by the seeing.

The braille typewriter, as invented by Frank Hall in 1891, has already been described. Similar writers have later been manufactured in this country and abroad. On most braille typewriters the characters appear before the operator and may be read at convenience. Such machines, therefore, serve the blind for composing manuscripts or working mathematics in the same way that the typewriter serves the seeing.

A highly contracted form of braille known as grade three is used by a small number of students and professional blind persons. There is also a shorthand system employing phonetics. Braille shorthand machines are made which write on a ribbon of paper wound on spools. The speed of writing depends on the operator and on the degree of contraction which he chooses to use. An efficient operator of the braille typewriter may average from forty to sixty words a minute, while the average is considerably higher for practiced writing on the shorthand machine.

#### ON THE PRINTING OF BRAILLE

Punctiform printing was first done from movable type; later from thin metal sheets cast from such type. Paper placed over embossed type or sheets will receive full impression under a rubber cushion. Such paper must be about twice the weight of ordinary book paper. It may be dampened prior to printing so as to yield more perfectly to the embossing process.

Movable type is no longer used. About 1889 the hammer and punch method of punctating zinc, tin, or brass sheets began. But the Hall stereotyping machine appeared, and very shortly afterward a similar machine, called the Stereograph, for printing New York Point, was designed.

Line letter was embossed only on one side of the sheet, although books were sometimes made in which adjoining pages were pasted back to back to give the effect of two-side printing. One-side printing naturally continued after point systems came in vogue. But when the use of metal sheets became the fashion in England and Germany the practicability of two-side printing was soon established. This consists of using a folded sheet, the impressions being stamped through both laps at the same time. The laps are separated and the paper insinuated between them. When pressure is applied, the inner points meet the inner pits and shape the paper, as if a layer of dough were pressed between two saucers. If the lines are slightly separated, it is possible to write between them on the opposite side, so that the paper is embossed on both sides at the same time, the inner pits from below pushing up and those from above pushing down through the paper. Interlining gradually gave way in Europe after 1900 to interpointing. This method fills both sides of the page with lines normally spaced. the machine being set so accurately that the points of one side falls between those of the other. American presses all use the interpointing system today.

Late in the 1920's the Experimental Shop of the American Foundation for the Blind worked out an improved model of the stereotyping machine which is manufactured under the supervision of the American Printing House for the Blind. Only in recent years have a few publishers had presses custom-built for their specific purpose of embossing braille.

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Rodenberg, L.W.

The story of books for the blind. 1952.

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